

§ 23.904

forward of the inlet case (fan disconnect) must be addressed, the passengers must be protected, and the airplane must be controllable to allow for continued safe flight and landing.

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§ 23.904 Automatic power reserve system.

If installed, an automatic power reserve (APR) system that automatically advances the power or thrust on the operating engine(s), when any engine fails during takeoff, must comply with appendix H of this part.

[Doc. No. 26344, 58 FR 18970, Apr. 9, 1993]

§ 23.905 Propellers.

- (a) Each propeller must have a type certificate.
- (b) Engine power and propeller shaft rotational speed may not exceed the limits for which the propeller is certificated.
- (c) Each featherable propeller must have a means to unfeather it in flight.
- (d) The propeller blade pitch control system must meet the requirements of §§ 35.21, 35.23, 35.42 and 35.43 of this chapter.
- (e) All areas of the airplane forward of the pusher propeller that are likely to accumulate and shed ice into the propeller disc during any operating condition must be suitably protected to prevent ice formation, or it must be shown that any ice shed into the propeller disc will not create a hazardous condition.
- (f) Each pusher propeller must be marked so that the disc is conspicuous under normal daylight ground conditions.
- (g) If the engine exhaust gases are discharged into the pusher propeller disc, it must be shown by tests, or analysis supported by tests, that the propeller is capable of continuous safe operation.
- (h) All engine cowling, access doors, and other removable items must be designed to ensure that they will not sep-

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arate from the airplane and contact the pusher propeller.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964, as amended by Amdt. 23-26, 45 FR 60171, Sept. 11, 1980; Amdt. 23-29, 49 FR 6847, Feb. 23, 1984; Amdt. 23-43, 58 FR 18970, Apr. 9, 1993; Amdt. 23-59, 73 FR 63345, Oct. 24, 2008]

§ 23.907 Propeller vibration and fatigue.

This section does not apply to fixed-pitch wood propellers of conventional design.

(a) The applicant must determine the magnitude of the propeller vibration stresses or loads, including any stress peaks and resonant conditions, throughout the operational envelope of the airplane by either:

- (1) Measurement of stresses or loads through direct testing or analysis based on direct testing of the propeller on the airplane and engine installation for which approval is sought; or
- (2) Comparison of the propeller to similar propellers installed on similar airplane installations for which these measurements have been made.

(b) The applicant must demonstrate by tests, analysis based on tests, or previous experience on similar designs that the propeller does not experience harmful effects of flutter throughout the operational envelope of the airplane.

(c) The applicant must perform an evaluation of the propeller to show that failure due to fatigue will be avoided throughout the operational life of the propeller using the fatigue and structural data obtained in accordance with part 35 of this chapter and the vibration data obtained from compliance with paragraph (a) of this section. For the purpose of this paragraph, the propeller includes the hub, blades, blade retention component and any other propeller component whose failure due to fatigue could be catastrophic to the airplane. This evaluation must include:

- (1) The intended loading spectra including all reasonably foreseeable propeller vibration and cyclic load patterns, identified emergency conditions, allowable overspeeds and overtorques, and the effects of temperatures and humidity expected in service.